



# ICAO ENGINE nvPM EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: PW815GA BYPASS RATIO (-): 5.7  
 UNIQUE ID NUMBER: 01P22PW142 PRESSURE RATIO  $\pi_{co}$  (-): 34.6  
 COMBUSTOR: TALON X  
 ENGINE TYPE: MTF RATED OUTPUT  $F_{co}$  (kN): 71.2

### REGULATORY DATA

CHARACTERISTIC VALUES:	$LTO_{mass}/F_{co}$ (mg/kN)	$LTO_{num}/F_{co}$ (particles/kN)	NVPM MASS CONCENTRATION ( $\mu\text{g}/\text{m}^3$ )
LTO/ $F_{co}$ AND MAX $nvPM_{mass}$	17.9	2.92E+14	57
AS % OF CAEP/10 LIMIT	-	-	0.7
AS % OF CAEP/11 LIMIT (InP)	0.6	1.6	
AS % OF CAEP/11 LIMIT (NT)			

### MEASURED DATA

MODE	POWER SETTING (% $F_{co}$ )	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES*		NVPM MASS CONCENTRATION PEAK $nvPM_{mass}$ ( $\mu\text{g}/\text{m}^3$ )
				$EI_{mass}$ (mg/kg)	$EI_{num}$ (particles/kg)	
TAKE-OFF	100	0.7	0.701	11.0	1.51E+14	
CLIMB OUT	85	2.2	0.579	5.0	8.67E+13	
APPROACH	30	4.0	0.204	1.2	4.72E+12	
IDLE	7	26.0	0.071	1.3	3.30E+13	
LTO TOTAL (kg, mg, number of particles)			266	918	1.50E+16	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE LTO/ $F_{co}$ VALUES (mg/kN, particles/kN)				12.9	2.10E+14	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ( $\mu\text{g}/\text{m}^3$ )				11.0	1.51E+14	44

\* Emissions Indices are corrected for thermophoretic loss and fuel hydrogen content

### DATA FOR EMISSIONS INVENTORIES (ESTIMATIONS FOR ENGINE EXIT PLANE VALUES)

MODE	POWER SETTING (% $F_{co}$ )	CORRECTED EMISSIONS INDICES	
		$EI_{mass\_sl}$ (mg/kg)	$EI_{num\_sl}$ (particles/kg)
TAKE-OFF	100	14.5	5.63E+14
CLIMB OUT	85	6.7	3.40E+14
APPROACH	30	1.4	9.71E+12
IDLE	7	2.0	1.64E+14

### AMBIENT CONDITIONS

	From		To		FUEL	
	BAROMETER (kPa)	TEMPERATURE (K)	HUMIDITY (kg water/kg dry air)	HEAT OF COMBUSTION (MJ/kg)		
BAROMETER (kPa)	100.0	293.6	0.0065	43.26	HYDROGEN CONTENT (%mass)	13.82
TEMPERATURE (K)	293.6	303.0	0.0149	16.0	AROMATICS CONTENT (%vol)	16.0
HUMIDITY (kg water/kg dry air)	0.0065	0.0149		0.68	NAPHTHALENE CONTENT (%vol)	0.68
				120	SULPHUR CONTENT (ppm by mass)	120

MANUFACTURER: Pratt & Whitney Canada  
 TEST ORGANIZATION: Pratt & Whitney Canada  
 TEST LOCATION: Longueuil & Mirabel, Quebec, Canada  
 TEST DATES: 16/07/2019-18/07/2019

### REMARKS

1. P&WC ER 7572 Rev. D includes CO-0003044 and CO-0005972.
2. Engines tested: GA0020B19.
3. Data acquired using procedures and systems prescribed in Annex 16 Volume II, Amd. 9.
4. Thermophoretic correction applied as described in Annex 16 Volume II, Amd. 9, Appendix 7, Section 6.2.1.
5. Data corrected for fuel hydrogen content according to CAEP11.WP91 App.A
6. Export classification: EIPA NSR, DPA No, US-I 9E991, OUS-I NSR.